



# Crane Operator NCCCO

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## Practice Questions

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### 1. When must a pre-shift inspection of a crane be performed?

- A. Before each shift during which the crane will be used
- B. Once per week on Monday mornings
- C. Only when a new operator takes over the crane
- D. At the start of every month

### 2. On a mobile crane load chart, what does the rated capacity represent?

- A. The maximum load the crane can lift at a given radius under specified conditions
- B. The weight of the crane itself including counterweights
- C. The maximum travel speed of the crane while loaded
- D. The minimum load required to keep the crane stable

### 3. Before beginning crane operations each day, the operator must perform which of the following?

- A. A pre-shift inspection of the crane
- B. A load test at maximum capacity
- C. A lubrication of all wire ropes
- D. A calibration of the rated capacity limiter

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### 4. Which type of sling is most susceptible to damage from sharp edges on a load?

- A. Wire rope sling
- B. Chain sling
- C. Alloy chain sling
- D. Synthetic web sling



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**5. Which OSHA standard specifically governs cranes and derricks in construction?**

- A. 29 CFR 1926 Subpart CC
- B. 29 CFR 1910 Subpart N
- C. 29 CFR 1926 Subpart R
- D. 29 CFR 1910 Subpart H

**6. Ground bearing pressure is calculated by dividing the total crane load by which measurement?**

- A. The contact area of the outrigger float or crawler shoe
- B. The total weight of the crane only
- C. The radius of the lift
- D. The height of the boom

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**7. What hand signal is used to tell the crane operator to hoist (raise) the load?**

- A. Arm extended, index finger pointing up, moving in a horizontal circle
- B. Arm extended, palm facing down, moving up and down
- C. Both arms raised above the head, palms facing out
- D. Arm extended horizontally with a closed fist

**8. What is the minimum safe working clearance required from an energized power line when the voltage is unknown?**

- A. 10 feet (3 m)
- B. 5 feet (1.5 m)
- C. 15 feet (4.6 m)
- D. 20 feet (6.1 m)

**9. Which of the following is included in a pre-shift (frequent) inspection of a mobile crane?**

- A. Disassembly and inspection of all rope sheaves
- B. Load testing at 100% rated capacity
- C. Visual inspection of all control mechanisms for proper operation
- D. Magnetic particle testing of the boom

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**10. What is the working radius on a crane load chart?**

- A. The vertical height from ground to boom tip
- B. The horizontal distance from the crane's center of rotation to the center of the load
- C. The diagonal distance along the boom from pivot to hook
- D. The distance from the front outrigger pad to the load

**11. During a pre-operation inspection, the operator notices a kink in the wire rope. The operator should:**

- A. Continue operations if the kink is minor
- B. Wrap the kinked section with tape and continue
- C. Remove the crane from service until the rope is replaced
- D. Operate at 50% of rated capacity until repaired

**12. What color tag on a synthetic web sling indicates the sling is rated for a Working Load Limit (WLL) that must never be exceeded?**

- A. Red tag indicates overload capacity
- B. Blue tag shows the minimum break force
- C. The manufacturer's tag shows the WLL and must remain attached
- D. Green tag indicates the sling has been proof-tested

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**13. Which organization issues the NCCCO Certified Crane Operator (CCO) credential?**

- A. OSHA
- B. NCCCO
- C. ASME
- D. ANSI

**14. Before extending outriggers, the operator should verify that all personnel are:**

- A. Seated inside the cab
- B. Clear of the outrigger extension path and float landing zone
- C. Wearing hard hats only
- D. Standing by to guide the float



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**15. What hand signal instructs the crane operator to lower the load?**

- A. Arm extended, index finger pointing up, moving in a horizontal circle
- B. Both hands placed on top of each other, pushed downward
- C. Arm extended, index finger pointing down, moving in a horizontal circle
- D. Arm waving overhead from side to side

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**16. Who is responsible for identifying the voltage of all power lines in the crane's work zone before operations begin?**

- A. The rigger
- B. The crane operator
- C. The employer
- D. The signal person

**17. Who is responsible for conducting the pre-shift inspection of a crane?**

- A. The lift director only
- B. A qualified/competent person or the operator
- C. A certified structural engineer
- D. The crane manufacturer's representative

**18. When rated capacities decrease as the radius increases on a load chart, this is primarily because:**

- A. The boom gets shorter at greater radii
- B. Hydraulic pressure drops at longer extensions
- C. The overturning moment increases, reducing stability margin
- D. The hoist rope becomes longer and heavier

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**19. A crane's load chart shows a capacity of 18,000 lb at a 40-foot radius. What is the maximum load the operator should lift at that radius?**

- A. 20,000 lb because the chart has built-in safety factor
- B. 18,000 lb — the chart value is the maximum allowable load
- C. 16,200 lb after applying a 10% derating
- D. 15,000 lb to maintain a 20% safety margin



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**20. As a sling angle decreases from 90° (vertical) toward 0° (horizontal), the tension in each leg of a two-leg bridle sling:**

- A. Decreases proportionally
- B. Increases significantly
- C. Remains constant regardless of angle
- D. Is unaffected because the load weight does not change

**21. According to OSHA 1926.1412, how often must a shift inspection be conducted on a crane?**

- A. Weekly
- B. Before each shift
- C. After each use
- D. Monthly

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**22. Most mobile crane manufacturers require the crane to be set up level within:**

- A. 5 degrees in any direction
- B. 3 degrees in any direction
- C. 1 degree in any direction
- D. 0.5 degrees in any direction

**23. Which hand signal means 'Stop' during a crane lift?**

- A. Both hands clasped together overhead
- B. Arm extended horizontally, palm facing down
- C. One hand raised with all fingers spread
- D. Both arms crossed at chest height

**24. For a power line operating at 345 kV, what is the minimum required clearance distance under OSHA 1926.1408 Table A?**

- A. 10 feet (3 m)
- B. 16 feet (4.9 m)
- C. 20 feet (6.1 m)
- D. 25 feet (7.6 m)

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**25. During a pre-shift inspection, the operator finds that the load line anti-two-block device is not functioning. What is the correct action?**

- A. Continue operations at reduced speed
- B. Tape the device and document the defect for the next maintenance cycle
- C. Operate with a spotter watching the block at all times
- D. Remove the crane from service until the device is repaired

**26. Which document takes precedence when there is a conflict between a crane's operator manual and the load chart affixed to the crane?**

- A. The operator manual always takes precedence
- B. OSHA regulations always override both
- C. The most conservative (lower capacity) value from either source
- D. The load chart affixed to the crane, as it reflects the specific machine's rated capacity

**27. A crane is configured with a 100-foot main boom and a 30-foot jib. The jib is offset at 15 degrees. When looking up capacity, the operator must use:**

- A. The 100-foot boom with jib chart section at 15-degree offset
- B. The 130-foot boom column in the main boom chart
- C. The 100-foot boom chart without jib correction
- D. The 30-foot jib chart as the primary reference

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**28. A two-leg bridle sling supports a 10,000 lb load. The sling angle (angle between each leg and the horizontal) is 45°. Approximately how much tension is in each leg?**

- A. 5,000 lb
- B. 7,071 lb
- C. 10,000 lb
- D. 7,071 lb — each leg carries half the load divided by  $\sin 45^\circ$

**29. During a pre-shift inspection, the operator notices a visible crack in the load hook. What action should be taken?**

- A. Remove the crane from service until the hook is repaired or replaced
- B. Apply a welded repair patch and continue operations
- C. Reduce the load by 25% and continue carefully
- D. Document the defect and notify the supervisor at shift end



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**30. Outrigger float pads (cribbing) are used primarily to:**

- A. Raise the crane higher off the ground
- B. Center the crane over the load
- C. Reduce vibration during the lift
- D. Distribute the outrigger load over a larger ground area



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## Answer Key & Explanations

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**1. A — Before each shift during which the crane will be used**

ASME B30.5 and OSHA 1926.1412 require a visual inspection before each shift the equipment is to be used. This ensures any damage or defect that occurred since the last use is caught before operations begin.

**2. A — The maximum load the crane can lift at a given radius under specified conditions**

Rated capacity is the manufacturer-specified maximum load the crane may lift at a particular radius and configuration. Exceeding it is prohibited because the chart already includes a stability and structural safety factor.

**3. A — A pre-shift inspection of the crane**

ASME B30.5 requires operators to conduct a pre-shift inspection before each shift to identify any deficiencies that could affect safe operation. Load tests and detailed lubrication are not required daily.

**4. A — Wire rope sling**

Synthetic web slings are most susceptible to damage from sharp edges because the nylon or polyester webbing can be cut. Wire rope and chain slings are far more resistant to sharp-edge damage.

**5. A — 29 CFR 1926 Subpart CC**

29 CFR 1926 Subpart CC is the OSHA standard that specifically covers cranes and derricks used in construction activities. Subpart N covers general industry material handling, but construction crane operations fall under Subpart CC.

**6. A — The contact area of the outrigger float or crawler shoe**

Ground bearing pressure equals total load (crane + load + rigging) divided by the supporting contact area of the outrigger float or crawler shoe. A smaller contact area produces higher pressure on the ground.

**7. A — Arm extended, index finger pointing up, moving in a horizontal circle**

The ASME B30.5 standard hand signal for 'Hoist' is an arm extended with the index finger pointing up and moving in a small horizontal circle. This universally recognized motion mimics the rotational direction of the hoist drum.

**8. A — 10 feet (3 m)**

OSHA 1926.1408 and NCCCO standards require a minimum clearance of 10 feet when voltage is unknown or cannot be determined. Greater clearance may be required once voltage is confirmed.

**9. C — Visual inspection of all control mechanisms for proper operation**

Pre-shift (frequent) inspections include visual checks of control mechanisms, wire rope, hooks, and safety devices. Disassembly, load testing, and non-destructive testing (NDT) are part of periodic inspections.

**10. B — The horizontal distance from the crane's center of rotation to the center of the load**

Working radius (also called load radius) is the horizontal distance measured from the crane's center of rotation to the center of the suspended load. It is the key variable used to look up rated capacity on the chart.



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**11. C — Remove the crane from service until the rope is replaced**

A kink in wire rope is a disqualifying deficiency per ASME B30.5. Kinks permanently damage the rope structure and it must be replaced before the crane returns to service. Partial-load operations with damaged rope are not permitted.

**12. C — The manufacturer's tag shows the WLL and must remain attached**

ASME B30.9 requires that synthetic web slings retain their manufacturer's identification tag, which lists the WLL for different hitch configurations. Removing or obscuring this tag renders the sling out of service.

**13. B — NCCCO**

The National Commission for the Certification of Crane Operators (NCCCO) is the accredited body that issues the CCO credential. This certification is widely accepted as meeting the OSHA requirement for operator certification.

**14. B — Clear of the outrigger extension path and float landing zone**

Outrigger extensions can injure anyone in their path. All personnel must be well clear before outriggers are extended or set down to prevent crush injuries.

**15. C — Arm extended, index finger pointing down, moving in a horizontal circle**

The standard 'Lower' signal mirrors the 'Hoist' signal but with the index finger pointing downward and moving in a horizontal circle, indicating the direction of load travel.

**16. C — The employer**

OSHA 1926.1407 places the duty on the employer to determine the voltage of power lines in the work zone before crane operations begin, so appropriate clearances can be established.

**17. B — A qualified/competent person or the operator**

OSHA 1926.1412 specifies that equipment must be inspected by a qualified person or, for the pre-shift visual inspection, by the operator prior to use each shift.

**18. C — The overturning moment increases, reducing stability margin**

As radius increases, the overturning moment (load × radius) grows. To keep the crane within its stability and structural limits, the allowable load must decrease proportionally.

**19. B — 18,000 lb — the chart value is the maximum allowable load**

Load chart values are the maximum rated capacities and already incorporate the required safety factors. Operators must not exceed the chart value; no additional operator-applied derating is required or appropriate.

**20. B — Increases significantly**

As the horizontal angle decreases, each sling leg must exert greater force to support the same vertical load component. At 30° the tension exceeds twice the load per leg, which is why shallow angles are dangerous.

**21. B — Before each shift**

OSHA 1926.1412 requires that the operator conduct a visual inspection at the start of each shift to check for items such as visible defects, fluid leaks, and operational controls. This shift inspection must be documented.

**22. C — 1 degree in any direction**

Manufacturers typically specify a maximum out-of-level tolerance of 1 percent grade (approximately 1 degree). Exceeding this reduces rated capacity and affects structural integrity.



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**23. B — Arm extended horizontally, palm facing down**

The 'Stop' signal requires the arm to be extended horizontally with the palm facing downward. This is a clear, authoritative signal that the operator must immediately halt all motion.

**24. B — 16 feet (4.9 m)**

OSHA Table A specifies 16 feet (4.9 m) minimum clearance for voltages between 300–350 kV. Clearance requirements increase with voltage to account for potential arc flash distances.

**25. D — Remove the crane from service until the device is repaired**

Anti-two-block devices are required safety devices. OSHA 1926.1416 states that if a required safety device is not functioning, the equipment must be taken out of service until repaired. Operating with a substitute measure does not satisfy the regulation.

**26. D — The load chart affixed to the crane, as it reflects the specific machine's rated capacity**

The load chart physically on the crane represents the manufacturer's rated capacity for that specific unit and configuration. ASME B30.5 requires operators to comply with the crane's rated load chart; the manual supplements but does not replace it.

**27. A — The 100-foot boom with jib chart section at 15-degree offset**

Jib configurations have separate sections in load charts that account for jib length, jib offset angle, and boom angle. Treating the combined length as a straight boom would give an incorrect and potentially dangerous capacity.

**28. D — 7,071 lb — each leg carries half the load divided by sin 45°**

Tension per leg =  $(\text{Load} / 2) / \sin(\text{angle})$ . At 45°:  $(10,000 / 2) / \sin(45^\circ) = 5,000 / 0.707 \approx 7,071$  lb. This demonstrates why steep angles (close to 90°) keep leg tension near half the load.

**29. A — Remove the crane from service until the hook is repaired or replaced**

A cracked load hook is a critical structural defect that requires immediate removal of the crane from service. The hook must be repaired or replaced and the crane re-inspected before returning to use, per OSHA 1926.1412 and ASME B30.2.

**30. D — Distribute the outrigger load over a larger ground area**

Cribbing or outrigger float pads spread the point load of an outrigger float across a greater surface area, reducing ground bearing pressure to within the soil's safe bearing capacity.



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